DOCUMENT RESUME

ED 150 758 EC 103 652

AUTHOR Crowner, T. Timothy; And Others
TITLE The Madison Alternative for Zero Exclusion: Final Report. July 1, 1974 Through June 30, 1977.
INSTITUTION Madison Public Schools, Wis.
SPONS AGENCY Bureau of Education for the Handicapped (DHEW/OE), Washington, D.C.
PUB DATE 77
NOTE 81p.

EDRS PRICE MF-$0.83 HC-$4.67 Plus Postage.
DESCRIPTORS *Custodial Mentally Handicapped; Elementary Secondary Education; Mentally Handicapped; *Multiply Handicapped; *Program Descriptions; *Program Development; *Program Evaluation; Public Schools; School Services; Severely Handicapped
IDENTIFIERS *Wisconsin (Madison)

ABSTRACT

Presented is the final report of the Madison (Wisconsin) Alternative for Zero Exclusion (MAZE) project to develop public school services for 211 profoundly retarded and/or multiply handicapped students (5- to 21-years-old). Part I includes a description of the program with sections on the following components: an overview; the service delivery model (which consisted of a transdisciplinary approach, a pupil assessment process, an evaluation design, various curriculum approaches, home visitations, and follow through); both inservice and preservice educational training; curriculum development; and dissemination of information on the MAZE project. Reported in part II are the results of program evaluation and student progress through use of such instruments as the Balthazar Scales of Adaptive Behavior. Findings are cited for the following areas: eating, dressing, toileting, unadaptive and adaptive self-directed behaviors, unadaptive and adaptive interpersonal behaviors, verbal communication, play activities, and response to instructions. The data is seen to show that the MAZE students have improved eating behaviors, some dressing behaviors, and some toileting skills; as well as showing shifts for unadaptive to more adaptive self-directed behavior and some improvement in terms of verbal communication with staff. (SBH)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED150758

THE MADISON ALTERNATIVE FOR ZERO EXCLUSION:

FINAL REPORT JULY 1, 1974 THROUGH JUNE 30, 1977

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

Submitted by

T. Timothy Crowner, Ph.D.: Project Director
Ms. Bambi L. Lyon: Project Assistant
Mr. Richard G. Briggs: Project Evaluator
Mr. Alan R. Pearlman: Media Specialist

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Lee J. Gruenewald

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

EC103652

Madison Metropolitan School District
Dr. Douglas S. Ritchie, Superintendent
Madison, Wisconsin

TABLE OF CONTENTS

Page

PART I - The Program

Overview 1

Service Delivery Model 5
- Transdisciplinary
- Pupil Assessment
- Evaluation
- Curriculum
- Parents
- Follow Through

Educational Training 17
- Inservice
- Preservice

Curriculum Development 22

Dissemination 25

PART II - The Evaluation

Student Progress Report:
Balthazar Scales of Adaptive Behavior. 35
- Rationale
- Instrument Selection

The Balthazar Scales 40
- Description of the Scales

Observational Procedures for a Balthazar Scales. 41
- Training of Observers

Analysis and Reporting Methods 43
- Analysis Procedures
- Statistical Methods
- Limitations of This Method

Page

Findings. 52
General Descriptive Data
BSAB-I: The Eating Scales
BSAB-I: The Dressing Tally
BSAB-I: The Toileting Questionnaire
BSAB-II: Unadaptive Self-Directed Behaviors
BSAB-II: Unadaptive Interpersonal Behaviors
BSAB-II: Adaptive Self-Directed Behaviors
BSAB-II: Adaptive Interpersonal Behavior
BSAB-II: Verbal Communication
BSAB-II: Play Activities
BSAB-II: Response to Instructions

Overall Summary of Balthazar Data 70

Epilog. 73

PART I

The Program

OVERVIEW

This is the final report of Madison's Alternative for Zero Exclusion (MAZE). MAZE was a project intended to develop public school services for severely/profoundly handicapped persons. The operating district was the Madison Metropolitan School District (MMSD) of Madison, Wisconsin. Major funding for MAZE was provided by a contract between MMSD and the Department of Health, Education, and Welfare, U.S. Office of Education, Bureau of Education for the Handicapped (BEH). Other sources of funding included categorical funds from the State of Wisconsin and local tax revenues.

MAZE provided educational services to 211 students from 5-21 years of age. Direct instructional services were available to 91 students who are profoundly retarded and/or multiply handicapped. Forty-five of these students were housed in a self-contained facility while the remaining 46 were served in regular elementary schools. A categorical model of the population of students receiving services from the MAZE Project is provided in Figure 1 on page 2. At the conclusion of the 1976-1977 school year, the self-contained facility will have been closed, and all 91 students will have been housed in regular elementary schools, thereby fulfilling an underlying objective of the project by providing normal environment for all severely/profoundly handicapped students where they may benefit from contact with normal peers and where normal peers may benefit from contact with the handicapped.

FIGURE 1

POPULATION SERVED

	SEVERELY/PROFOUNDLY RETARDED						MODERATELY/SEVERELY RETARDED						MULTI-HANDICAPPED						PHYSICALLY HANDICAPPED						
	0-3	4-8	9-12	13-18	19 +	Total	0-3	4-8	9-12	13-18	19 +	Total	0-3	4-8	9-12	13-18	19 +	Total	0-3	4-8	9-12	13-18	19 +	Total	TOTAL
YEAR ONE	0	4	4	19	3	30	0	21	20	23	16	80	0	2	20	26	2	52	0	21	9	15	0	45	207
YEAR TWO	0	6	5	21	4	36	1	24	22	27	18	92	0	7	24	29	3	51	1	20	7	14	0	42	221
YEAR THREE	0	6	13	9	7	35	0	14	26	34	10	84	0	10	28	17	1	56	2	17	7	10	0	36	211

Support services were provided to 120 students who transferred into regular elementary, middle, and high schools in recent years. These students are moderately to severely retarded and have received only minimal support from the project. Full support was provided locally. Multidisciplinary team evaluations were conducted for all students, and "M-Team" recommendations were incorporated into Individual Educational Plans (IEP) used in the planning of instructional programs. IEP's were designed and monitored constantly by a transdisciplinary team with formal reviews semiannually.

Inservice training was offered to staff in areas relevant to the education of severely/profoundly handicapped children which was available in certification programs. The medical implications of serving this population was of particular significance. Inservice workshops were sponsored in areas such as degenerative diseases, seizure disorders, death and dying (educating autistic-like children) and other specific diseases leading to severe handicapping conditions. Parents participated regularly in these sessions.

MAZE provided practicum experiences for graduate and undergraduate students enrolled in special education, communication disorders, psychology, social work, music education, adaptive physical education, and art education at the University of Wisconsin-Madison. In addition, MAZE held affiliations with the University of Wisconsin-Madison and Washington University in St. Louis in the areas of physical and occupational therapy. Service orientation programs were also actively pursued with pediatric interns, residents and prac-

titioners.

A standardized measure (Balthazar, Scales I and II) was used to assess pupil progress of severely/profoundly handicapped students. Pre and post tests were conducted as a measure of pupil progress over the 1976-1977 school year.

Dissemination of information about the MAZE Project occurred through the publication and distribution of curriculum guides and position papers pertaining to the education of severely/profoundly handicapped individuals. Similar articles were published in professional journals. Project staff presented components of the model at various national, state, and local conferences. MAZE also cooperated with the State Department of Public Instruction (DPI) to provide workshops for teachers, administrators, and support staff relevant to the education of severely/profoundly handicapped individuals in public schools. Information about project activities and available materials was provided to various Regional Resource Centers, the American Association for the Education of the Severely/Profoundly Handicapped (AAESPH), and the Educational Resources Information Center (ERIC). A film, "The Big Yellow Schooner to Byzantium", was produced by the National Association for Retarded Citizens (NARC) with the cooperation of the MAZE Project. This film depicts the educational program within the project as a model for the nation. Local television stations throughout the country are expected to televise this film.

SERVICE DELIVERY MODEL

The purpose of the MAZE Project was to provide a public school service delivery model for the education and treatment of severely/profoundly handicapped children. Specific elements of the service delivery model included: a) a transdisciplinary approach, b) a pupil assessment process, c) an evaluation design, d) various curriculum approaches, and f) follow through. Each of these elements were evolved over the three year period. Each has been discussed in detail in separate documents. The reader is referred to the list of written products in the dissemination section of this report. Each element of the service delivery model will be briefly reviewed in this section

Transdisciplinary

Transdisciplinary models not only enforce interdisciplinary cooperation but encourage interchangeability across disciplines. This process can be referred to as a "skills swap", where each discipline must inservice all other disciplines so that all disciplines acquire many "traded" skills. Where resources will not allow for a large transdisciplinary staff, a primary professional may be designated to implement intervention strategies developed by other disciplines. In this model the teacher is most often designated as the primary professional. Such a role has strong implications for the management skills of teachers. Inservice training in all available support services and in management strategies is important to teachers in such a model.

The transdisciplinary model is most effective when serving the severely/profoundly handicapped. Transdisciplinary models have certain characteristics which lend themselves well to the needs of severely/profoundly handicapped persons. From a programmatic viewpoint, there are too few persons available, particularly within support disciplines.

Transdisciplinary service models contain two other important characteristics which should be mentioned. Synergism results from transdisciplinary interactions. That is, the power of a staff to affect positive change increases beyond the sum of its collective individual skills. For example, the teacher enhances therapy goals and the therapist enhances educational goals. Advocacy also arises from transdisciplinary services because natural modifications within individual positions develop as a result of group input and feedback.

Pupil Assessment*

Four assessment strategies were followed within the context of a transdisciplinary model using applied behavioral analysis designs:

1. When assessing a severely/profoundly handicapped student, it is advised that specific activities for the student be created to provide a standard of observation for each discipline.

2. It should also be made clear, initially, who will collect what information so that duplication of duties does not occur. Each discipline should focus upon specific areas for assessment purposes.

*See, "A Guide to Multi-Disciplinary Evaluation Procedures for Children with Exceptional Education Needs, a product of the MAZE Project." Madison Metropolitan School District, Madison, Wisconsin.

3. It is important to determine how information will be collected. For example, it might be decided that the classroom teacher will engage the student in certain activities while the other professionals observe unobtrusively. Or perhaps the occupational therapist will visit the home during mealtime. Some standardized measures associated with psychology or therapy may be deemed appropriate.

4. There must be interdisciplinary agreement. That is, a behavior, or lack of a behavior, must be considered absent or present by two or more disciplines. Often, the parent fills the role of a reliability checker. This strategy is continued throughout the student's schooling.

In order to coordinate this process an evaluation team manager was appointed on a case by case basis. Managers were most often social workers. Occasionally some other discipline was appointed because of the need for some specific expertise. Once the need for special education was determined, the M-Team prepared a report documenting how the essential educational elements differed from the current program, including curriculum scheduling, instructional methods, instructional materials, behavioral management, and peer/adult interactions. Included in the M-Team plan were: a) a statement of the child's needs; b) goal statements designed to meet the child's needs in the area of academic and/or behavioral interventions, supportive services, related services, and school/parent communications; c) a statment regarding the duration of special education including the projected date of enrollment, the anticipated length of involvement, and the

time allotted for special and/or regular education on a daily basis, and d) provision for regularly scheduled follow-up consultation.

Input from parents and outside agency personnel was encouraged during the development of the M-Team plan. The M-Team plan was reviewed and approved by the program administrator before placement occurred. Upon placement, an Individual Educational Plan (IEP) was developed for each child which was reviewed and revised twice a year.

In addition two task forces on assessment ran concurrently in 1976-1977. Each examined aspects of educational and medical assessment relevant to the severely/profoundly handicapped population: the Task Force and the Medical Needs Assessment. The Educational Assessment Task Force consisted of seven classroom teachers of severely/profoundly/multiply handicapped students, a speech and language therapist, an occupational therapist, a psychologist, a University practicum student, and it was chaired by the Program Support Teacher who designed an assessment tool for severely/profoundly/multiply handicapped.

It is very difficult to measure the acquisition of skills for the severely/profoundly handicapped child, especially in relation to the developmental scales based upon normal development. These scales may not accurately reflect the development of severely/profoundly handicapped children because of their many physical and mental deficits which impede normal development. Although new scales have been developed especially for the severely/profoundly handicapped

population, many professionals in this field believe there is no one instrument that measures progress across the wide range of developmental disabilities inherent in this population. For these reasons, this task force studied the feasibility of designing an assessment tool for severely/profoundly handicapped students.

A search of literature was conducted, and existing assessment tools were weighed against the measures of effectiveness determined necessary by this task force. These measures were: a) leads to effective programming; b) content validity; c) flexibility across time, settings, and persons; d) reliability; and e) ease in administration. The task force is now designing a tool to meet these measures of effectiveness. The content of the assessment tool will include cognitive, self-help, social, motor, and communication skills. The kinds of tests being developed included check lists, informal observations, and inventories. This assessment tool will continue to be used in the child's naturalized settings which include the home, school, and community. Two significant people in each environment will assess every child. For example, the communication section of this tool will contain several categories to identify intent of communication as well as a scoring procedure to include examples of vocal and nonvocal behaviors. The child's activities will be recorded along with the recording of the behavior as self-initiated or respondent. The child will be assessed at his home, school and other locations in the community in order to check for consistency and reliability. Two significant people in his home could be selected

from teachers, aides, therapists, psychologists, social workers, etc. Two significant people in a community setting could be selected from his parents, siblings, teachers, therapists, etc. This tool is scheduled for completion by spring of 1978.

The diversified medical needs of severely/profoundly handicapped children have had a great impact on families and schools as well as medical, paramedical, and nursing services. This population has a high degree of medical needs. Some needs are acute in nature while others are chronic and long term.

A survey of parents of severely/profoundly handicapped children served by MAZE showed that many were unaware of how to obtain medical and paramedical services. Moreover, they were often unaware of what medical care should be accessed.

As the public schools became more involved in providing uniform services to handicapped children, it became apparent that staff should become better informed of the proper referral procedures to be followed when medical concerns arise.

The medical needs assessment task force included a school psychologist, a pediatrician, a nutritionist, an occupational therapist, a physical therapist, a speech and language therapist, a cardiovascular specialist, audiologist, and two parents. Additional members were added to the task force. A nurse, who is also the parent of a retarded child, and three physicians (a periodontist, and orthopedic surgeon, and a pediatric ophthalmologist) served as consultants.

This task force identified important medical information which should be gathered on severely/profoundly handicapped children. Ways in which parents and staff may access this information was determined. The potential of a medical needs screening instrument has also been explored.

A report on both the educational and medical needs assessment task forces was made to the 101st Annual Conference of The American Association on Mental Deficiency in June, 1977. A document, Parent/Advocate Guide to Comprehensive Health Care for Severely and Profoundly Handicapping Conditions, should be available in late fall of 1977.

Evaluation*

Evaluation, as it is being used here, refers to a systematic process for gathering information on student performance for purposes of making decisions about a student. Formal evaluations were conducted under the direction of a school psychologist who maintained the outsiders perspective. Evaluation was ecological in nature and included heavy parent involvement. Figure 2 on page 12 summarizes the following steps in evaluation.

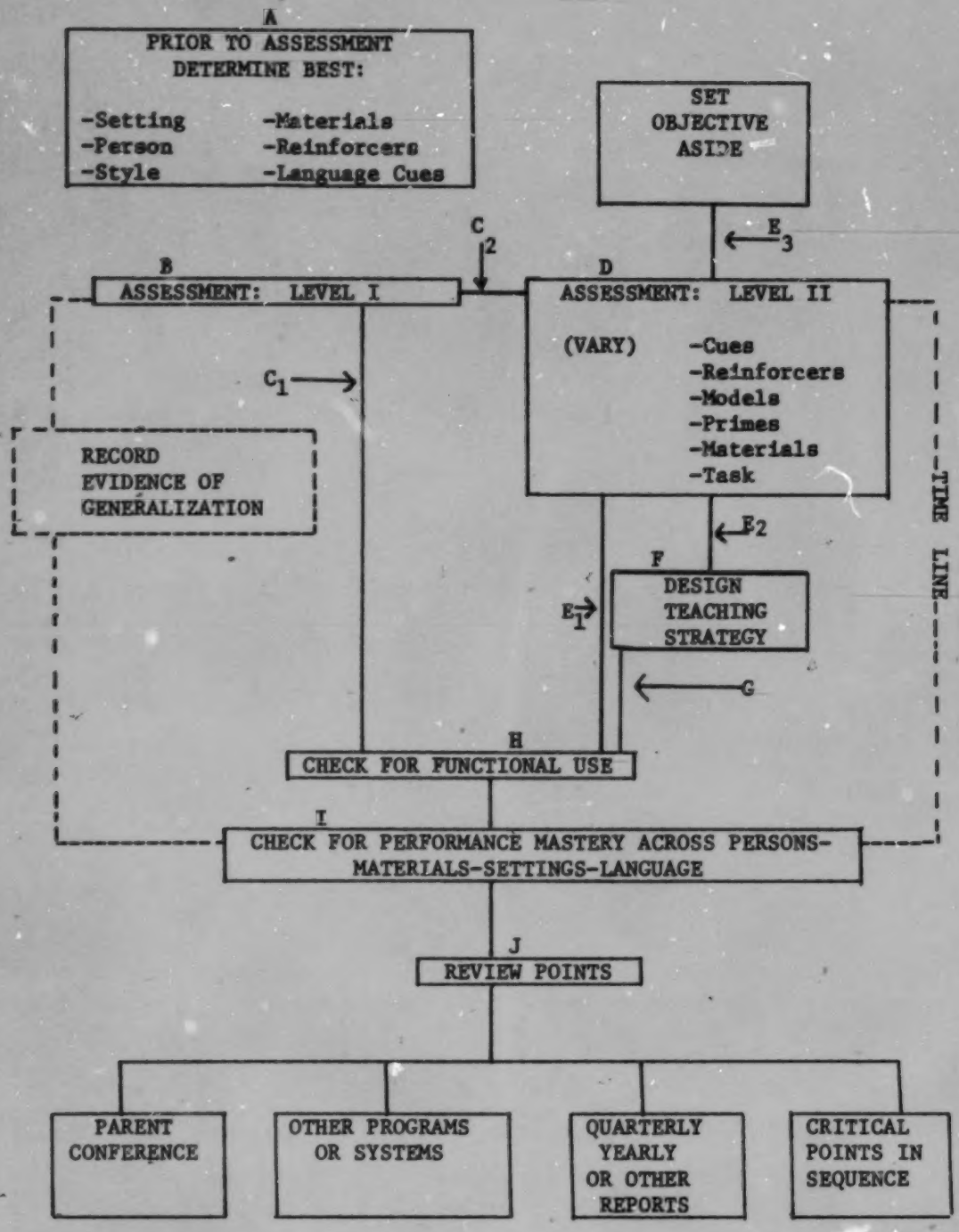
The model portrayed in Figure 2, basically consists of seven steps:

1. Box A: Prior to formally assessing students, become familiar and comfortable with them. Informally assess student's skills and what environmental events control their behavior. Use informa-

*For further information see, DeSpain, C., Evaluation of the severely retarded and multi-handicapped - an alternative in L. Brown, T. Crowner, W. Williams, and R. York (Ed.), professor's Alternative For Zero Exclusion: A Book of Readings, Vol. V, Madison Metropolitan School District, Madison, Wisconsin, 1975.

FIGURE 2

MAZE EVALUATION PROGRAM ASSESSMENT PHASE



tion from this informal assessment to determine optimal assessment conditions.

2. Box B: Assessment Level I - Assess one or more objectives from the skill sequence under optimal but controlled conditions. If students fail the objective, go to Box D (Assessment Level II); if they pass, go to Box H (check for functional use).

3. Box D: Assessment Level II - If students could not perform the skills required by an objective in Level I assessment, assess students' behavior under varied conditions to determine what conditions (e.g., cues, models, prompts, reinforcement) they can perform the skills. Use information from this assessment to develop an instructional strategy (Box F).

4. Box F: Teach students the target skills.

5. Box H: Assess student mastery of skills. First verify that they can use the skill in the performance of functional tasks which frequently occur (e.g., setting the table, dressing). If they use the skill across functional tasks, formally check skill performance across persons, materials, settings and language cues (Box I).

6. Box I: Verify student performance of skills across persons, materials, settings and language cues.

7. Box J: Review (reassess) student skill performance.

The evaluation design shown in Figure 2 is criterian based. In order to provide a standardized measurement the Balthazar Scales were administered to the more profoundly handicapped persons being

served. An explanation and discussion of that aspect of evaluation is detailed in the program evaluation section of this report.

Curriculum

Instruction was offered in six curriculum areas; communications, socialization, gross and fine motor, self-care, cognitive skills, and occupational education. Activities were planned which incorporated the objectives of several curriculum areas into a given event. Thus, a child may be working toward achieving objectives in all curriculum areas during one activity, such as mealtime. The curriculum and activities utilized were designed to maximize functional skills to allow for survival in the least restrictive environment.

Instruction was offered in several different settings. Instructional programs took place in restaurants, shopping centers, crosswalks, transportation modes, apartments, parks, and other community settings, as well as in the classroom. Therapy was also conducted in each of these environments rather than in an isolated clinic.

Many specific instructional sequences were evolved. These are available in the "MAZE Curriculum and Reading series Vol. IV - VI (See list of written products in the dissemination section of this report.)

Parents

A system of release time for teachers and therapists provided an opportunity for home visitations on a regular basis. Staff members went to students' homes on such occasions to review the educational programs with the parents. Parents were advised of ways to enhance

these programs in the home and were invited to provide input into the revision of such programs to best meet the needs of their child. Parents also participated in assessment and curriculum task forces. Often, parents acted as advocates for other parents during evaluation and placement proceedings.

In an effort to enable staff and parents to communicate more effectively, a Parent Needs Assessment was conducted by Eugene Wendt, Deborah Vanderheiden, Nancy Scheuerman, and Lisbeth Vincent. The questionnaire was entitled "The Parent Needs Assessment Scale" and addressed the following areas: a) demographic data; b) parent interpersonal relationships; c) involvement with community agencies and professionals; d) the child's self-image; e) parent/child interactions; f) extended family; g) community interaction; h) physical care; i) sibling relationships; j) future plans; and k) the usefulness of this questionnaire. Preliminary findings suggested that sibling relationships and future plans rank very high for further exploration, advice or support. It was also apparent that many parents find it difficult to describe their child's self-image.

Follow Through

The needs of parents of young adults contributed to the development of a county-wide plan of service for developmentally disabled people by an interagency committee. One of the committee's points of emphasis concerned the transition of severely handicapped adults from the public schools into other community service agencies. It was recommended that "Individual Life Plans" be developed for each client,

and that consumer groups monitor them. Representatives from the Madison Metropolitan School District (MAZE Project) met with staff from other local agencies to develop this plan. Other agencies involved were: Madison Opportunity Center, Division of Vocational Rehabilitation, Goodwill Industries, Department of Public Instruction, Crisis Intervention Center, Madison Association of Retarded Citizens, Residential Facilities Development Foundation, Wisconsin Council for Developmental Disabilities, Lakeshore Manor, Central Wisconsin Center, Coordinator for Advocacy Program, and New Concepts Foundation.

EDUCATIONAL TRAINING

MAZE did not dichotomize between preservice and inservice training in the traditional sense. Preservices and inservices were integrated parts of the program. MAZE established links with many departments at the University of Wisconsin-Madison including Behavioral Disabilities, Occupational Therapy, Physical Therapy, Communicative Disorders, Social Work, Psychology, Pediatrics, Educational Administration, Adaptive Physical Education, Music, and Art. Although no MAZE funds were expended on preservice activities, MAZE staff cooperated in the development of teacher training, therapy affiliations, and pediatric residencies. Such efforts were made in order to influence the nature of preservice training programs. MAZE staff served as visiting lecturers and consultants to the university training programs. Managing and supervising university students' practical experiences, however, was the main activity of MAZE personnel. Using a task force model, MAZE was able to accomplish preservice, inservice, parent participation, and curriculum development in one process.

Inservice

Each task force was jointly appointed by project and university staff. A MAZE staff person, or a doctoral level graduate student was appointed chairperson. Chairpersons were responsible for directing the activities of the task force, coordinating with other task force chairpersons, and completing the task force which consisted of parents, teachers, instructional aides, developmental therapists (O.T. or P.T.), psychologists, and graduate and undergraduate train-

ees from a variety of disciplines. The interaction of these individuals focusing on a need or problem provided many inservice/preservice experiences.

Each staff member received local professional (salary) advancement credits at the rate of 1 credit per 15 hours of participation on a task, Madison Metropolitan School District supports such salary advancement. MAZE also offered professional advancement credits for participation in MAZE-sponsored classes and independent studies under the project director. MAZE staff who taught structured inservice courses were paid through MAZE fundings.

MAZE has conducted many formal inservices throughout the past three years. Physicians, psychologists, teachers, therapists, administrators, and teacher trainees shared vital information with staff, parents, and university students so that all may better serve the severely/profoundly/multiply handicapped in the future. These relevant inservices included: Medical Conditions and Health Needs of the Severely/Profoundly/Multiply Handicapped; Non-verbal Communication; Epilepsy; Autism, Music Education for Physically and Perceptually Impaired Students; Delivering Instructional Materials Center Services to Severely/Profoundly Handicapped Students; Pre-vocational Training; Sensori-Motor Curriculum; Handling Techniques; Media and Methods for Teaching Severely/Profoundly Handicapped Students; Therapeutic Techniques and Curriculum; Emergency Care Polices and Procedures; Coordinated Curriculum and Articulation; Transdisciplinary Model; and Transition to Integrated Elementary Schools.

The inservices during the 1976-1977 school year were primarily related to the closing of Badger School. Only a year ago, moderately to severely retarded students were served in this self-contained facility. This year 38 students were served in two middle schools and two high schools. It became apparent that the need to coordinate curriculum and the decision system for student articulation was of prime importance. On March 25, 1977, an inservice for teachers and therapists from all centers was held to obtain a consensus of opinion about six areas of curriculum to be coordinated across schools, plus the introduction of a level plan which would place curriculum in a developmental hierarchy. At the end of this year, Badger will no longer be a center to serve in an outreach capacity. Therefore, this inservice was of particular value to teachers in order to insure a system for the continued coordination and development of curriculum across a number of local schools.

Another important inservice was sponsored by the MAZE Project and took place on April 1, 1977. The title of this inservice was, "Community Based/Public School Programs for Children with Autistic-Type Behavior". The guest speaker was Ann Donnelson-Walsh of Santa Barbara, California. Parents and professionals received information about providing services to this population. This inservice marked the commencement of a task force on service delivery problems for autistic students. The purpose of this task force was to develop a long range plan for direct services to autistic children in the Madison public schools. Ms. Walsh was brought in to consult with

the task force and all relevant literature was made available to them. It is hoped that through this task force a consistent educational program for autistic type children will continue to grow and develop.

Most of the severely/profoundly handicapped students from Badger School will be served at Glendale Elementary School. The staff and parents from both schools jointly sponsored three inservices to plan for the transition of their program. On May 2, 1977 the Badger staff held an inservice at Badger in order to better acquaint the Glendale staff and parents with the severely/profoundly handicapped population and programs. On May 16, 1977 the Glendale staff reciprocated with an inservice program highlighting their program. On May 19, 1977 the third joint inservice was held at Glendale for all staff and parents of all students who will attend Glendale next fall.

Preservice

One of the major project goals related directly to preservice training, "to develop a model public school/university cooperative preservice/inservice training program and to help fill current manpower needs in the nation."

This goal was met, as MAZE became a model cooperative training program through the development of practicum experiences in the public schools for students in several university departments as well as student teachers in the Department of Behavioral Disabilities. In addition to practicum training, cooperative participation on task

forces was accomplished, and cooperative seminars were conducted. MAZE helped fill manpower needs during the past three years, especially in the areas of teaching, administation, and teacher training.

CURRICULUM DEVELOPMENT

Thirteen task forces studied specific areas of curricula pertinent to the education of the severely/profoundly handicapped over the past three years. The curricular areas that were developed included: language, reading skills, math skill sequences, family-life, sex education and social skills, job skills, purchasing skills, fine and gross motor, tracking and scanning, non-verbal communication, functional object use, problem solving, vocational preparation, and coordinating curriculum. Products of these task forces have been published in MAZE curriculum guides.

Four task forces in 1976-1977 studied and developed curricula primarily in non-verbal communication functional object use, problem solving, and coordinated curriculum coordination to promote better classroom articulation.

The objective of the task force on non-verbal communication was: to delineate written curricular strategies for teaching selected non-verbal communication skills to severely/profoundly handicapped students. Since many severely/profoundly handicapped children are non-verbal, alternative forms of communication (such as sign language, gestures, and communication boards) had to be made available to these students. This was a relatively new area of curriculum and thus required a teaching strategy. The participants of this task force included university students enrolled in Teaching Methods for the Severely Handicapped, teachers of severely/profoundly handicapped students, and a doctoral student from the Department of Studies in Be-

havioral Disabilities at the University of Wisconsin-Madison.

The objective for the task force on Functional Object Use was: to develop a curriculum for teaching functional object use skills to severely/profoundly handicapped students. Many severely handicapped students lack the skills necessary to use and functionally interact with objects. Therefore, it is likely that functional object use skills are critical to the development of other critical skills such as language, concept formation, discrimination, and so on. This task force developed instructional programs for functional object use skills relevant to: a) domestic environments; b) leisure and recreational situations; c) post school settings; and d) public facilities.

University methods students and one doctoral student from the Department of Studies in Behavioral Disabilities participated in this task force. Three teachers of the severely/profoundly handicapped consulted with the task force in addition to an occupational therapist. A parent also contributed to this curriculum.

The objective for the task force on Problem Solving was to develop a problem solving curriculum for secondary age students that begins with rudimentary search skills and culminates in more sophisticated social problem skills. Many secondary TMR students, when placed in a problem situation, do not complete the actions necessary to solve the problem. Since problem solving skills are crucial to independent functioning in community, domestic and vocational settings, a

curriculum designed to teach such skills was felt to be necessary.

This task force was chaired by a doctoral student from the Department of Studies in Behavioral Disabilities. Five undergraduate students from the same university program actively participated, and three secondary teachers performed advisory roles.

The objective of the task force for Curriculum Coordination and Classroom Articulation was to design a system to identify and sequence curriculum goals for six different levels. Levels I through VI pertained to elementary TMR children whose chronological ages ranged from 5-14. Level V pertained to middle school TMR students whose chronological ages ranged from 14-17, and Level VI pertained to high school TMR students whose chronological ages ranged from 17-21. With this kind of organization, teachers prepared students for the next highest level and could communicate with one another about developmental progress. Ideally, Madison received a child at age five and progressed through these six levels. Realistically, Madison still obtains children at age eighteen or older who have not had previous educational experiences and who are functioning at Levels I or II. Nevertheless, this organization helped the teacher expose this student to sound developmentally-based curriculum while at the same time teaching him coping behaviors for survival. Reports of these task forces will be developed into a seventh volume of the MAZE curriculum guides which will be available in the fall of 1977.

DISSEMINATION

MAZE Project dissemination activities were pursued in two different ways. The first was a passive mode and was designed to respond to individual requests for materials and other information from local, state and federal sources. The other, an active mode, involved the creation of opportunities to share information with others.

During the first and second project years, efforts were made to coordinate the distribution of information with other agencies, such as regional resource centers, parent and professional organizations, local television and radio stations, and the State Department of Public Instruction. As other centers began informing people of the MAZE activities, project personnel concentrated more heavily on passive kinds of dissemination.

One active form of dissemination was the development of public information material. Local newspaper articles, television and radio newscasts, and presentations to service groups were all used to inform the public of project activities. In-house media, such as the local school district newsletters, were also good vehicles for information sharing.

The BLAST, a monthly program/project newsletter at Badger, allowed for student participation in the form of poetry, art work, and short stories from all instructional centers. This newsletter contributed to a positive parent-school relationship. As a result of the newsletter, parents were made aware of special activities at school as well as those offered by other organizations.

Nationally, this project submitted articles that have appeared in major magazines, i.e., U.S. News and World Report, Mental Retardation News (a newsletter of the NARC), and special interest journals such as Wisconsin Vocational Education and Wisconsin Libarary Bulletin.

MAZE Project staff coordinated and cooperated in local efforts in the development of a major motion picture about the severely handicapped during the third project year "The Big Yellow Schooner to Byzantium" was filmed in Madison in September, 1976 by the NARC. The fifteen minute film will be made available to the 1,800 state and local associations across the country and will serve as an example of how parents and the school district work together to provide education for the severely handicapped. The film spurred much local interest. Numerous articles about the film were published in area newspapers, and news spots were broadcast on local television and radio stations.

Technical articles such as position papers and curriculum were reported in professional journals, book chapters, and other publications. Specifically, articles have appeareed in A Systematic Approach to the Instruction of the Moderately, Severely and Profoundly Retarded, published by Charles E. Merrill; Educational Programming for the Severely and Profoundly Handicapped, published by the Council for Exceptional Children (CEC); Hey! Don't Forget About Me: Education's Investment in the Severely and Profoundly Handicapped, also published by CEC; Beyond the Ordinary, University Park Press; and

the locally published TMR Curriculum Guides, Volumes I, II, III, IV, V and VI which are collected papers and curricula concerning service delivery systems and instructional programming for the severely handicapped child.

University of Wisconsin-Madison students from the Department of Studies in Behavioral Disabilities and project staff worked together to develop these books. The books were a very successful and substantial part of technical information dissemination. The project was the sole distributor of these guides and over 2,000 books were distributed during the last three years. In addition to formal book chapters, project personnel developed brief overviews of specific program areas, i.e., mealtime skills, as well as classroom descriptions and selected articles which are available free to those who request them.

Conference presentations at the local, state and national level were important avenues of information dissemination. Project staff presented formal papers at local, state, and national conferences at the Council for Exceptional Children, the American Association on Mental Deficiency, the National Association for Retarded Citizens, and the American Association for Education of the Severely and Profoundly Handicapped. Staff who developed the particular program discussed were selected as presentors. Programs discussed included education, therapy, psychology, social work, program support and administrative personnel.

Besides these presentations, resource rooms and exibition tables were provided to distribute additional information during these conferences. This method of information dissemination led to follow-up requests for information or on-site visitation, and was, overall, a very effective way to distribute information. On-site visitations were designed to meet the needs of those who want first-hand knowledge with direct classroom contact. The quantity of visits was not the projects' major emphasis. Rather, the quality of the visitor's experience was the project staff's most important concern. Site visitations were designed individually to best meet the needs of each visitor. Individuals were interviewed prior to their visits to determine their: a) affiliation with special education; b) current activities in the field; c) primary interest in MAZE; d) time available for visiting and desired type of visit (tour, classroom observation, educational/therapeutic participation, discussion, etc.). Over 400 people participated in structured on-site visits during the project's three-year existence.

On-site visitations were not possible where large numbers of staff from another program sought to attend. However, technical consultations were arranged whereby project staff visited with other school systems, universities, etc., to conduct training workshops. These were planned individually according to the needs of the other program. MAZE Project monies were not expended on this activity.

MAZE organized workshops at the state level for teachers of the severely handicapped, and conferences with developmental disability

specialists and other professionals providing services to handicapped adults. Other conferences, such as the conference on 'Community Based Programs for School Age Children with Autistic-Type Behaviors' (part of the autism task force discussed earlier), were sponsored by MAZE in conjunction with Madison Metropolitan School District's Department of Specialized Educational Services.

Conference presentations, technical consultations, and numerous mediated slide presentations were produced to support the workshops. Typically, these consisted of 35mm slide or videotaped presentations. The Media Specialist worked with the presentor(s) to develop a suitable presentation. Slide presentations and videotapes were made available to other schools and universities upon request. A two-part series of videotapes was produced which documents the multidisciplinary and curriculum development aspects of the project. These were viewed by visitors and distributed nationally upon request.

MAZE became actively involved with the national materials networks currently functioning. These include: the Learning Resources Network, made up of the National Center on Educational Media and Materials for the Handicapped (NCEMMH), along with the Special Offices (SO's), and Area Learning Resource Centers (ALRC). Also, the National Instructional Materials Information Service (NIMIS) is part of this network. Each of the above mentioned projects received information regarding the MAZE Project on a continual basis. This information included bibliographies of available materials, project

overviews, and complimentary copies of curriculum guides and other products. Technical assistance in the development of a joint information sharing project, Help Educators Locate Products (HELP), between American Association for the Education of the Severely/Profoundly Handicapped (AAESPH) and Special Office 3 (SO 3) was provided by project staff.

MAZE provided articles to the Midwest Regional Resource Center which were included in the center's information packages for workshops on severely/profoundly handicapped. MAZE also provided information to the Educational Resources and Information Center (ERIC), and the Council for Exceptional Children (CEC) information clearinghouse.

Locally, information was forwarded to the Regional Developmental Disabilities Information Center (RDDIC), the University of Wisconsin-Madison, and the Madison Metropolitan School District's Instructional Materials Center, as well as the Wisconsin Cooperative Educational Service Agency #15's Special Educational Instructional Materials Center, and the University of Wisconsin's Mental Retardation and Human Development Resource Center.

On an active level, the project media consultant sponsored numerous meetings with resource center personnel, such as the Special Office 3. Technical assistance was provided to inform the centers of both teacher-made and commercially produced materials relevant to the severely handicapped population. Mediated (35mm slides) programs and

materials were also provided to the centers for use in conference presentations. The MAZE Project was a major resource of materials and strategies relevant to the education of the severely handicapped, and provided a referral service to other information centers as well.

In addition to activities related to dissemination, the MAZE Project developed educational materials relevant to the other local school systems serving the severely handicapped. A materials production process facilitated material development (see the MAZE fourth quarterly report for 1975-1976). The process helped to guide the staff through the traditional instructional design process. A partial list of permanent products follows:

"Problems and Issues in Serving Severely Handicapped Students in the Public Schools - An Interdisciplinary Decision" Videotape, 20 minutes, 1976, B&W.

"Development of Educational Programs for Moderate-Severely Handicapped Students", Videotape, 20 min., 1976, B&W.

"A Guide to Multi-Disciplinary Team Evaluation Procedures for Children with Exceptional Educational Needs", Revised 1976, free.

A Collection of Papers and Programs Related to Public School Services for Severely Handicapped Students, Volume IV, Madison Metropolitan School District, Madison, Wisconsin, 587 pages., 1975, $8.00.

Madison's Alternative for Zero Exclusion: A Book of Readings, Volume V, Madison Metropolitan School District (MMSD), 600 pgs., 1975, $8.00.

Madison's Alternative for Zero Exclusion: Papers and Programs Related to Public School Services for Secondary Age Severely Handicapped Students, Volume VI, Part 1, MMSD, 419 pgs., 1976, $8.00.

Madison's Alternative for Zero Exclusion: Papers and Programs Related to Teaching Reading Skills to Severely Handicapped Students, Volume VI, Part 2, MMSD, In Press, 1977, $8.00

Madison's Alternative for Zero Exclusion: Toward an Integrated Therapy Model for Teaching Motor, Tracking and Scanning Skills to Severely Handicapped Students, Volume VI, Part 3, MMSD, 249 pgs., 1976, $8.00.

A Bibliography on: Cooperative Planning for Transition of Severely Handicapped/Developmentally Disabled Children into Public Schools, State Department of Public Instruction - Title VI-D (EHA)/Project MAZE, MMSD, Madison, Wisconsin, 1977, Free.

Parent's Guide to Medical/Health Needs of Severely and Profoundly Handicapped Students, MMSD, Madison, Wisconsin, 60 pgs., In Press, 1977, $1.50 est.

Medical Data Facilitation for Public School Records, MMSD, Madison, Wisconsin, 10 pgs., (forms), 1977, Free.

Madison's Alternative for Zero Exclusion: A Collection of Papers About Planning and Implementing Programs for Severely and Profoundly Handicapped Persons in Public Schools, MMSD, Madison, Wisconsin, 1977, Price undetermined.

Signs for You: Communicating with Sign Language: (1976), 139 leaves, unbound, illustrated, $3.50.

Teaching Beginning Guitar and Ukelele Skills to Moderately and Severely Handicapped Students, 76 pgs., 1977, $2.50.

A Dialogue on Specific Medical and Health Concepts of Severely and Profoundly Handicapped Students, 65 pgs., 1977, Free.

A quantitative analysis of MAZE dissemination activities is depicted in Figure 3 on page 34.

FIGURE 3

A THREE YEAR QUANTITATIVE ANALYSIS OF MAZE DISSEMINATION ACTIVITIES

	1st Project Year				2nd Project Year				3rd Project Year				TOTAL
DISSEMINATION ACTIVITIES	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	
1. Distribution of Books	150	130	90	175	201	319	240	125	225	150	216	263	2,284
2. Other Publications	4	0	0	0	0	3	0	3	6	1	4	7	28
3. Public Information [1]	2	1	3	2	3	9	2	3	6	2	8	3	44
4. Organization Workshops	0	0	1	0	0	0	0	1	1	1	1	2	7
5. Conference Presentations	2	3	16	6	10	13	7	16	5	6	4	6	94
6. Quarterly Reports	1	1	1	1	1	1	1	1	1	1	1	1	12
7. Through Resource Centers	0	1	1	1	2	3	3	3	3	3	3	3	26
8. Visitors	28	34	41	10	38	70	68	40	31	38	40	24	462
9. Consultations [2]	0	0	2	2	1	5	4	1	3	1	0	3	23
10. Mediated Presentations	2	0	10	6	6	33	0	14	7	6	4	6	94
TOTAL	189	171	165	203	262	456	325	207	288	209	281	318	3,074

1 & 2 Expenditures in these areas have not been charged to project monies.

PART II

The Evaluation

STUDENT PROGRESS REPORT:

BALTHAZAR SCALES OF ADAPTIVE BEHAVIOR

Rationale

Evaluation in MAZE is a complex of several types of data which lead to several types of decisions. These decisions and actions have been summarized and reported to various audiences and agencies elsewhere. One data-decision type deals with student progress. Of course, this is only one component of a complete set of evaluation activities and the student progress component itself is subdivided into three types, these are:

1. Specific objectives and data maintained by teachers for use in developing and evaluating instructional programming and for reporting to parents.

2. Evaluation and assessment activities centering about the M-Team process.*

3. Evaluation and assessment activities which have implication for MAZE's administrative organization.

In the past MAZE made use of teachers' records and reports of students' educational progress to provide support for its claim that students

*See, "A Guide To Multidisciplinary Procedures For Children With Exceptional Educational Needs." Madison Metropolitan School District, 1976, Madison, Wisconsin.

were indeed making progress. Also endorsements of observers, ranging from outside visitors to school system consultants and support staff, were nearly unanimous in asserting that "good things" were happening to MAZE students. The problems with reliance on such data are too well known to elaborate at length here. There was a need for comprehensive and reliable pre- and post-data which would allow us to communicate pupil progress to a wider professional audience as well as to parents and ourselves. We wanted something that was feasible, objective, and, hopefully, standardized. Our existing data, admirably designed to fit with individual teachers' styles and addressed to individual students' problems, were simply unsuitable for communication to a wider audience.

MAZE priorities had been towards development of curricula programs and administrative structures and procedures which would make possible the delivery of educational services to the severely and multiply handicapped. We had first to deal with the immense problems of delivering educational services to students whose history may have included little or no public schooling and whose behaviors were more similar to institutional inmates than to public school children. These more acute priorities took precedence over finding or developing standardized, observational assessment instruments. We felt that progress was being verified by teacher maintained objective records which communicated with parents and other professionals concerned with the individual child's educational program. Existing standardized instruments, if feasible, tended to have technical problems. For example, many instruments which claimed to be objective measures turned out, on examination,

to merely codify teachers' judgment or opinions. Or they did not cover things which were of educational interest to the MAZE staff. As a result, the problem of providing reliable, communicative pre- and post-assessment data, while often addressed and considered, was never resolved.

Impetus for Change

Things came to a head when an evalution team from the Bureau of Education for the Handicapped made a site visit in the spring of 1976. They strongly recommended that we reexamine our priorities and implement standardized pre- and post-assessment procedures. They indicated that they, too, had seen "good things" happening to many students but that it was time to find ways of measuring and documenting student progress for purposes of program evaluation. We agreed with the recommendations of the site visitation team and re-ordered our priorities and began searching for a suitable measurement instrument.

Instrument Selection

Responsible staff persons examined published instruments to be used as pre- and post-measures because we had neither time, motivation, nor resources to develop our own. Also, published instruments would allow us to compare our sample to the sample used for standardization.

The instruments examined were:

1. A.A.M.D. ADAPTIVE BEHAVIOR SCALE FOR CHILDREN AND ADULTS: 1974 REVISION. Washington, D.C.: American Association on Mental Deficiency, 1974.

2. T.A.R.C. ASSESSMENT INVENTORY FOR SEVERELY HANDICAPPED CHILDREN. H. & H. Enterprises, 1975.

3. PENNSYLVANIA TRAINING MODEL: INDIVIDUAL ASSESSMENT GUIDE. Harrisburg, Pa.: Pennsylvania Department of Education, no date.

4. BALTHAZAR SCALES OF ADAPTIVE BEHAVIOR FOR THE PROFOUNDLY AND SEVERELY MENTALLY RETARDED: SECTION I, THE SCALES OF FUNCTIONAL INDEPENDENCE. Champaign, Ill.: Research Press, 1971.

5. BALTHAZAR SCALES OF ADAPTIVE BEHAVIOR: PART II, SCALES OF SOCIAL ADAPTATION. Palo Alto, Ca.: Consulting Psychologists Press, 1973.

6. BEHAVIORAL CHARACTERISTICS PROGRESSION. Palo Alto, Ca.: Vort Corporation, 1973.

7. Uzgiris, Ina C. and Hunt, J. McV., ASSESSMENT IN INFANCY: ORDINAL SCALES OF PSYCHOLOGICAL DEVELOPMENT. Urbana, Ill.; University of Illinois Press, 1975.

The Balthazar instruments were chosen as most appropriate for our population even though the instrument required considerable expenditure in terms of observer time and training. The Balthazar instruments came closest to meeting the following criteria established by the project director:

1. The instruments must measure things relevant to teachers. Simultaneously, they must produce measurement criteria of reliability and statistical significance in order to enhance communication with the wider profession.

2. Measurement procedures must be reliable, simple to administer after training, accepted as feasible by busy teachers, usable across a wide range of settings, and successively approximating an "ideal" measure.

We planned that the actual observations would be carried out by various support staff, such as psychologists, social workers, speech and language therapists, occupational therapists and physical therapists. We also planned to use videotape and other means for training in order to develop reliable observations. Finally, observers had only to fill in the report sheets and to perform no numerical manipulations of their

observations. We hoped to reduce the cost of staff time and effort by these techniques.

The Balthazar Scales

Description of the Scales

The Balthazar instruments are in two sections. Section I (BSAB-I) purposes to measure the functional independence of a student. It consists of three sets of scales: eating-drinking scales, dressing-undressing scales, and toileting scales. The eating scales consists of five classes; dependent feeding, finger foods, spoon usage, fork usage, and drinking. Also included is an eating checklist which was not analyzed for this report. The eating scale is designed to measure the representative behavior of the individual. The dressing scales are designed to measure the optimal performance of the individual. We broke it down into subscales of left and right shoes and socks and a subscale involving dressing and undressing of other clothing. The toileting scale, while designed to measure representative behavior, was in fact a questionnaire which was to be filled in by someone knowledgeable about the individual's toileting behavior. In reporting on scores on each of these this report will speak in some more detail about items on the scales.

The second section of the Balthazar instruments (BSAB-II) focuses more

on social behaviors and adaptations in contrast to BSAB-I. BSAB-II has seven broad categories of behaviors (unadaptive self-directed behaviors, unadaptive interpersonal behaviors, adaptive self-directed behaviors, adaptive interpersonal behaviors, verbal communication, play activities, and response to instructions). Each of the broad categories has one to five scales within it. Each of these will be described in more detail in the report section below.

Observational Procedures For a Balthazar Scales

Training of Observers

Occupational and physical therapists were intimately involved in curriculum areas involving eating, dressing and toileting. Thus they were chosen to be the observers for BSAB-I. Training consisted of the therapy staff meeting several times prior to both pre- and post-observations to become familiar with the appropriate manuals and observation forms, to define terms and to establish rules for coding observed behavior. At the completion of training, pairs of observers, usually both an occupational and physical therapist would observe the child in the appropriate situation and complete the coding sheet. Observations for the eating scale were carried on during regular meal-time programming sessions. Observations for the dressing tallies were done when the student was preparing for a sports activity. Then the pair of observers completed the toileting questionnaire drawing upon available records.

BSAB-II observations were carried out by program support teachers, psychologists, social workers, speech and language therapists, and administrative staff. This group was divided into four pairs of persons. Each pair formed an observation team who would record representative behavior of approximately twelve students. Prior to both pre- and post-observations the observers were trained to reliability using a combination of videotape and live observation. The training consisted of examining short sections of tape and coding the observed behavior. Then the tape was replayed and the gathered teams discussed how examples of each behavior should be coded. This process was continued until agreement on observations was attained.

Each pair of observers (for BSAB-II) observed a child for five minutes in each of three different settings. During the observation period each member of the team made independent notes on what he or she observed. Immediately following the observation session for each child, the pair of observers would jointly complete an observation form. During this time they would resolve any discrepancies between them by recalling the session they had just completed and by any necessary reference to the Balthazar manuals. One of the three 5 minute observations took place on the playground or while the student was at recess inside. This observation was an attempt to capture representative behavior while the student was least likely to be under direct instructional constraints. The other two observations were taken while the student was under some instructional constraint, but not in a direct one-to-one teaching/learning situation. We felt that

the student behavior in these latter situations would primarily represent his or her response to instruction rather than being a representative sample of his behavior.

This observational procedure is at variance with the procedure described in the Balthazar manuals. In the institutional setting where the Balthazar Scales of Adaptive Behavior were developed and first tried out, there were six 10 minute observational periods for BSAB-II. Scale scores were then developed by adding together the number of observations for each of the six 10 minute periods. We on the other hand had two individuals observe the student for three 5 minute periods and added these scores together to develop scale scores. We used this procedure to increase the reliability of observations and because we did not have the staff time to perform the more lengthy ones. We knew we would miss some important information but considered the trade-off the best we could do under the circumstances. In short, we went for reliability with some sacrifice in the range of behavior that we would be able to code.

Analysis and Reporting Methods

Analysis Procedures

The data reported below show an estimated score for the ward sample described in the Balthazar manuals, comparable scale scores for both

pre- and post-observations on MAZE students, and the post minus pre gain score for MAZE students. This format allows us to estimate how MAZE students stand in comparison to the ward sample for which Balthazar observational data were first collected and reported. The gain score comparison allows us to estimate the degree of growth during the 1976-77 academic year. An additional consideration has been to reduce the 415 data points collected for each student for each administration down to a digestible, readable report.

The first step was to sum the three observations resulting from BSAB-II. This summation yielded a set of scores representing the social adaptive behavior of each student across three separate settings. The next step was to subtract the pre-observation score from the corresponding post-observation score for each student who had a datum on both BSAB-I and BSAB-II. This subtraction yielded us the student's gain score for the 1976-77 academic year. Thus, we ended up with three large bodies of data; pre-test scores, post-test scores, and difference scores (gain scores).

The third step was to develop a set of standard scores for some of the scales. The BSAB-I contains five eating scales, an eating checklist, a dressing tally, and a toileting questionnaire. We developed standard scores for BSAB-I. The standard scores were necessary because many times the student had little or no opportunity to exhibit the behavior. For example, many of our students never had the opportunity to use a fork, hence had no chance to be rated on the fork usage scale. For

other scales there were times when it was impossible for the student to exhibit the behavior. In cases such as this the observer would enter a code which indicated the student had no opportunity to exhibit the behavior. Because of the missing data problem, we divided the sum by the number of available (non-missing) data points. Consider for example, each datum within one subscale of one of the eating scales is rated on a zero to ten basis. This particular subscale might contain 13 data points of which five might be missing because of no opportunity for the student to exhibit the behavior. The subscale score is generated by dividing the total by eight, the number of non-missing data points. Thus, the standard scale score would also be on a zero to ten basis.

BSAB-II scores do not require transformation to a standard form because there was no maximum score for each item and because there was no missing data. Scale scores were developed by summing data points for each student.

The fourth step was to develop a set of scale (or subscale) scores for each individual student. This was accomplished by adding together appropriate subsets of the pre-observation, post-observation, and difference data for each student. The report below reports only scale or subscale scores generated in this way.

The manuals for the BSAB-I report only the sum of scale scores rather than any kind of transformations by division or standard scores. We

have transformed the published figures in the same way that we transformed our own data to estimate comparable means for the ward samples. Since the data reported in the Balthazar manuals are themselves means and not individual data points this procedure leads us to somewhat less valid comparisons.

The Balthazar manuals for BSAB-II report the individual item means within each scale. In order to generate comparable ward sample scale scores we added the means of these individual items. In addition, our observation periods were one-fourth of the length of those reported in the Balthazar manuals, therefore, we divided the sums of reported Balthazar means by the value four (4).

Statistical Methods

Each subscale and scale score resulting from our transformations was analyzed using the UNISTAT 2* Program at the University of Wisconsin-Madison Academic Computing Center. This program computes most of the usual descriptive statistics as well as providing frequency histograms, confidence intervals and percentile ranges. We report means for each subscale and scale score and use the calculated 95% confidence interval in a point estimation procedure to decide upon "significance."

*UNISTAT 2: Univariate Descriptive Statistics and Histograms, Reference Manual for Univac 1100 Series Computers. Academic Computing Center, University of Wisconsin-Madison, April, 1976.

The confidence interval is calculated by first choosing a value of the random variable, Student t, such that the probability of its occurrence is equal to or less than .05. For these data this value was approximately 2.08, varying with the size of the sample. Then the standard error of the mean, calculated from the unbiased estimator of the standard deviation, is multiplied by approximately 2.08. (In practice, the program calculates the Student t value which satisfies the appropriate probability equation.) This product is then added to and subtracted from the value of the sample mean to yield the 95% confidence interval. If we assume that the sample mean is drawn from some (in our case, hypothetical) population, then we may assert that the probability is .95 that the population mean lies within the confidence interval.

We use the 95% confidence interval in a point estimation procedure as follows:

1. If an estimated ward sample mean lies outside the confidence interval for a MAZE pre- or post-observation mean, then we will claim that the MAZE sample mean is "significantly" different from the ward population, otherwise not.

2. If zero lies outside the confidence interval for one of the MAZE gain (or loss) means, than we will claim that the MAZE gain (or loss) is a "significant" gain (or loss), otherwise not.

3. We will attach the following codes to each pre- and post-observation for MAZE students:

(M-) This code means that the estimated mean for the ward sample lies outside and above the 95% confidence interval. We will interpret this to mean that the score for the MAZE sample is "significantly" lower than that of the ward sample.

(M0) This code means that the estimated mean for the ward sample lies within the 95% confidence interval. We will interpret this code to mean that the score for the MAZE sample does not "significantly" differ from that of the ward sample.

(M+) This code means that the estimated mean for the ward sample lies outside and below the 95% confidence interval. We will interpret this code to mean that the score for the MAZE sample is "significantly" higher than that of the ward sample.

4. We will attach the following codes to each gain (or loss) mean:

(-) This code means that zero lies outside and above the 95% confidence interval for the difference mean. We

will interpret this code to mean that the MAZE population had a "significant" score decrease during the pre- to post-observation interval.

(0) This code means that zero lies within the 95% confidence interval for the difference mean. We will interpret this code to signify that there was no "significant" score increase or decrease for MAZE students during the pre- to post-observation interval.

(+) This code means that zero lies outside and below the 95% confidence interval for the difference mean. We will use this code to signify that there has been a "significant" score increase for the MAZE sample during the pre- to post-observation interval.

The reader will note that some gain or loss scores may not be equal to the difference between the mean of the pre- and post-observations. This situation arises because the distribution of difference scores is not the same as the distribution of either pre- or post-scores. For example, there may be little change or even a small decrease in means of pre- and post-observation, while the difference scores show an increase. In this case, pre- and post-observations average out at nearly the same levels but some individuals show a gain and others show a loss. These alternative ways of looking at pre- and post-data are analogous to the "differences between" and the "differences within" in analysis of

variance methods applied to repeated measures.

Limitations of This Method

Right away we can be sure that about 5% of our judgments using these decision rules will be in error. Secondly, use of the confidence interval assumes that the population from which the sample is drawn is normally distributed. As it turns out, most of the pre- and post-observations data are strongly skewed. Most of BSAB-I scores cluster at the extremes of the score range and more than 90% of BSAB-II scores are the value zero. However, nearly all of the difference scores are approximately normally distributed. In the third place, the decision rule procedure described above is essentially a null hypothesis where the test figure (estimated mean for the ward sample or a difference of zero) is hypothesized to be the value of some phantom population mean. In other words, because we are describing data for a sample and not intending to generalize to a wider population, the use of inferential statistics at all is unwarranted. However, we want to estimate "significance" so we use the confidence interval, point estimation procedure to estimate whether or not the MAZE sample is part of this phantom population.

A more important limitation emerging from the methods we have used, is the possibility that our observations are either invalid or unreliable. The instruments are very complex requiring a large number of very fine

grained judgments. While we spent considerable time training observers for BSAB-II observations, it is clear that to become completely reliable would require extensive training in every single discrimination which needs to be made. We trained observers to the limit of our resources and capabilities. We chose to use observers who were not the regular classroom teacher both because we hoped to reduce observer bias and because regular classroom teachers were already busy on other kinds of tasks. The Balthazar instruments were originally designed to be completed by ward personnel who had continuous contact with subjects as they monitored and supervised their ward behavior. Public school classrooms on the other hand do not ordinarily employ the kind of monitoring personnel that wards do, therefore this is a considerable problem in the application and use of the Balthazar instruments in the public school setting.

Considering resource constraints and the fact that this was the first time we used the Balthazar instruments, we probably did as well as possible. We feel that we can place more than moderate confidence in conclusions which emerge from the pre- to post-observation comparisons and somewhat less confidence in comparisons based upon the ward samples. We judge that the possibility of error of judgments, although not precisely calculable, is within tolerable limits.

Findings

General Descriptive Data

The pre-observation was carried out in late September early October, 1976 and the post-observation was carried out in late April, 1977. Twenty-one females were observed for both pre- and post-observations and 29 males were observed on the pre-test pre-observation and 26 on the post-observation. We did not code other demographic information such as age, assigned grade level, degree of handicap, or type of handicap. These data are already available in the narrative section of the MAZE Final Report, July, 1977. The following sections of this report, provide a short description of the scale or scales, any methods of observation or scoring which amplify or are at variance with general methods described above, a summary table of the findings for each scale or subscale, and interpretations of the data using our decision rules.

BSAB-I: The Eating Scales

The eating scales consist of five classes; dependent feeding (nine items), finger foods (nine items), spoon usage (thirteen items), fork usage (thirteen items), and drinking (thirteen items). The eating scales range from very dependent to more independent feeding behaviors. Within each class, the individual items also range from dependent to

independent behaviors. Dependent Feeding ranges from "mouth is open" to cooperative removal of food to "manipulates food in mouth." Finger food ranges from merely eating finger foods to actively and appropriately manipulating foods with his or her mouth. Both spoon and fork usage start with eating tray foods and progress to increasingly accurate utensil use. And drinking progresses from merely drinking a liquid to accurately, appropriately using a cup. According to the manual, "The Eating Scales are designed to measure representative behavior of the subject, as demonstrated by specific eating skills observed during the course of one or more meals." (BSAB, Section I, Part I: Handbook For the Professional Supervisor, p. 9.)

Each item within each class was scored with a number ranging from zero to ten, representing the proportion, out of ten times attempted, that a particular behavior could be observed. For many items the student had no opportunity to display the behavior, hence the item was rated "N.O." A score for the class was generated by summing the items in each class and dividing by the number of non-missing data items. Thus the score for each class is also on a zero to ten scale. The means reported in the manual were transformed in a similar fashion to generate a zero to ten score for the ward sample.

SUMMARY DATA FOR EATING SCALES

Scale	Ward Sample Mean	MAZE Pre-Obs Mean	MAZE Post-Obs Mean	MAZE Gain or Loss Mean
CLASS I: Dependent Feeding	8.84	8.85 (M0)	9.43 (M+)	+0.62 (+)
CLASS II: Finger Foods	6.29	6.06 (M0)	7.07 (M0)	+1.07 (+)
CLASS III: Spoon Usage	5.43	5.80 (M0)	6.33 (M+)	+0.64 (+)
CLASS IV: Fork Usage	2.48 (1)	5.92 (M+)	5.59 (M+)	+0.30 (0)
CLASS V: Drinking Scale	7.25	6.55 (M0)	7.49 (M0)	+0.85 (+)

Note: (1) Manual notes Fork Usage study was incomplete.

Gain scores for all classes, except fork usage are significantly greater than zero. The gain scores cluster around levels of .5 to 1.5 with a few scores at the extremes of the possible 10 to +10 range. The gain score data provide evidence of student improvement on four of the five eating scales. More than half of the students had no opportunity to use forks. Of those where both pre- and post-data was submitted, there was a slight nonsignificant gain. For dependent feeding and spoon usage, MAZE scores were not significantly different from the ward sample scores on pre-test, while they were significantly better on the post-test. Thus, the data suggest that MAZE students were less like the ward population on post-observation than they were on pre-observation.

BSAB-I: The Dressing Tally

The dressing tallies are divided into male and female categories. The female dressing tally consists of a total of 30 observations about various dressing skills. The first 14 items deal with shoes and socks and are divided into left and right subscales. The remaining 16 items deal with other clothing. The dressing scales are administered in a manner designed to elicit optimal performance rather than just gathering a sample of representative behavior. The male dressing scale has a different and longer list of clothing items (18 items) but is otherwise identical.

Each item on each subscale is scored by the observer assigning a number ranging from zero to six. A zero is assigned if the student is merely a passive participant while a six is assigned if the student turns out an independent, perfect performance. We subdivided scale scores into three subscales, right shoes and socks, left shoes and socks, and other clothing. From these subscale scores we summed to generate a total scale score. For many items, the student had no opportunity to perform the particular behavior being observed either because they did not have a standard set of clothes or they were physically incapable of dressing and undressing. Thus, each of the summed subscale scores was transformed to a standard zero to six scale by dividing by the number of non-missing observations. Estimates for the ward sample do not include the subscales we used, therefore this comparison involves only the total scale score. Sums reported in the

manual were converted to a standard zero to six scale.

SUMMARY DATA FOR DRESSING SCALE

Scale	Ward Sample Mean	MAZE Pre-Obs Mean	MAZE Post-Obs Mean	MAZE Gain or Loss Mean
FEMALE:				
Right Shoes and Socks	n/a	2.70	2.89	+0.22 (0)
Left Shoes and Socks	n/a	2.50	2.89	+0.30 (+)
Clothing	n/a	2.71	2.94	+0.08 (0)
TOTAL FEMALE DRESSING	3.20	2.59 (MO)	2.89 (MO)	+0.22 (0)
MALE DRESSING TALLY				
Right Shoes and Socks	n/a	3.33	3.30	+0.18 (0)
Left Shoes and Socks	n/a	3.35	3.40	+0.28 (0)
Clothing	n/a	3.26	3.28	+0.27 (+)
TOTAL MALE DRESSING	2.89	3.30 (MO)	3.31 (MO)	+0.24 (+)

The data show slight increases for both female and male dressing scales, with the latter being significant. The data also show that two of the six sub[illegible]les increased significantly. Thus, there is evidence to indicat[illegible]at the dressing skills of MAZE students have improved slightly in the pre- to post-observation interval. Neither MAZE males nor MAZE females significantly improved their standing with respect to the ward sample.

BSAB-I: The Toileting Questionnaire

The toileting questionnaire is a twelve item survey designed to be administered in an interview situation with an aide, parent or other knowledgeable person. There are two broad categories in the

questionnaire - daytime and nighttime toileting behavior. We administered only the daytime portion. The questionnaire solicits information about the proportion of the student's urinations or defecations where the bladder or bowel is controlled or regulated. In addition the questionnaire probes the student's ability to appropriately adjust his or her clothing both before and after the toileting act.

The score entered for each of the eight items used in this study was the number of times, out of ten, that the particular behavior could be observed. The first item, "Bladder Uncontrolled," was not used to arrive at a total scale score for the toileting questionnaire and is reported separately. The remaining seven items are summed and bonus scores are added according to directions in the manual. The total scale score is developed by dividing this sum by the number of non-missing scores (again because many students had no opportunity to exhibit the behavior). Therefore, the student's total scale score could range from zero to ten. Since our administration of the toileting questionnaire was substantially different than the way it was administered on the ward sample, it is impossible to estimate a comparable score for the ward sample.

SUMMARY DATA FOR TOILETING QUESTIONNAIRE

Scale	Ward Sample Mean	MAZE Pre-Obs Mean	MAZE Post-Obs Mean	MAZE Gain or Loss Mean
Bladder Uncontrolled	n/a	2.74	2.73	-0.13 (0)
Toileting Scale	n/a	3.33	4.54	+0.63 (+)

The data indicate that there was no significant change from pre- to post-observation on the "Bladder Uncontrolled" portion of the questionnaire. There was a significant increase of the remaining toileting scale scores during the same interval. Thus, there is evidence to indicate that MAZE students' toileting behavior has improved during this period of time. The "Bladder Uncontrolled" item may represent a more involuntary behavior compared to a more labile, learnable set of behaviors measured by the balance of the toileting scale. If so, these data provide an interesting contrast.

BSAB-II: Unadaptive Self-Directed Behaviors

This section and the remaining six sections to follow are all from BSAB-II portion of the Balthazar Scales of Adaptive Behavior.

The first five scales on the Balthazar II observational instrument are grouped together under the broad heading of Unadaptive Self-Directed Behavior. The five scales are failure to respond (four items), stereotypy (stereopathy, posturing, including objects, seven items), nondirected repetitious verbalization, smiling, laughing behaviors (three items), inappropriate self-directed behavior (two items), and disorderly, nonsocial behavior (three items). The failure to respond scale, Scale 1, includes no response towards staff, to negative or inappropriate peer contact, to positive or appropriate peer contact, or to communication. Stereotypy, Scale 2, looks for physical repetition,

self-enduced emesis, posturing, vocal play, self-mutilation, and other similar behaviors. Scale 4 includes behavior such as genital play or masturbation, while Scale 5 looks for frustration reactions, destructive behavior, and other spontaneous disturbed behavior.

Scoring for these and all other scales for BSAB-II is either on an event or interval basis (Hall, 1971)*. Scale 1 (failure to respond) is an event scale while the remaining four scales are interval scales. Scale scores were generated for each student by summing across each item in each scale. Estimated means for the ward sample were developed by summing across reported item means and then dividing that sum by four because the duration of the MAZE observations was one-fourth those of the ward sample. This method of estimating ward sample means will be used for all subsequent BSAB-II scales reported below.

*Hall, R. V., Managing Behavior, 1: Behavior Modification: The Measurement of Behavior. Kansas City, Kansas: H. & H. Enterprises, 1971.

In event recording the observer makes a frequency count of the events as they occur. For example, the observer may count the number of times the student does not respond to a teacher's communication. In interval recording each observation session is divided into equal time periods, in our case five equal, minute-long, intervals. If during one of these intervals a specified behavior occurs a mark or count is made. For example, if the student is displaying object stereotypy in the first, third and fifth minutes of the five minute period then the item is scored three.

SUMMARY DATA FOR UNADAPTIVE SELF-DIRECTED BEHAVIORS

Scale	Ward Sample Mean	MAZE Pre-Obs Mean	MAZE Post-Obs Mean	MAZE Gain or Loss Mean
SCALE 1: Failure to Respond	0.29	1.00 (M+)	0.34 (M0)	-0.66 (-)
SCALE 2: Stereotypy	10.28	20.32 (M+)	11.96 (M0)	-8.57 (-)
SCALE 3: Non-Directed, Repetitious, Verbalization	1.37	1.46 (M0)	0.87 (M-)	-0.68 (0)
SCALE 4: Inappropriate, Self-Directed Behavior	0.21	0.12 (M0)	0.06 (M-)	-0.06 (0)
SCALE 5: Disorderly, Nonsocial Behavior	0.23	0.66 (M0)	0.26 (M0)	-0.36 (0)

Both Scale 1 and Scale 2 showed significant decreases during the pre- to post-observation interval. Scale 3, Scale 4, and Scale 5 showed nonsignificant decreases. With the exception of Scale 2, the pre- and post-observation scores were heavily skewed toward the value zero. The distribution of gain or loss scores for all scales (column five in the table above) were approximately normal.

Keeping in mind that this set of scales, "Unadaptive, Self-Directed Behavior," is a measure of inappropriate or negative behavior, there is evidence for a substantial improvement in both Failure to Respond and Stereotypy for MAZE students during the pre- to post-observation interval. The major improvements for the stereotypy scale occurred in items for physical repetition, posturing, and vocal play. There is

also evidence that other nonadaptive, self-directed behaviors certainly did not increase from an already low starting level.

MAZE students improved their standing in comparison to the ward sample during the pre- to post-observation interval. For Scales 1 and 2 MAZE students moved from significantly worse to no significant difference, while for Scales 3 and 4 MAZE students moved from no significant difference to significantly better. These findings are somewhat tentative because of the skewed distribution for pre- and post-observational data for Scales 3, 4, and 5.

BSAB-II: Unadaptive Interpersonal Behaviors

Unadaptive interpersonal behaviors are measured by two scales, Scale 6 (four items) and Scale 7 (eight items). Scale 6 observes inappropriate contact with both staff and peers while Scale 7 records observations of aggression or withdrawal. Both scales are event scales. We subdivided both scales into two subscales, one for staff and one for peers. The subscale score is the sum of the scores entered for each item.

SUMMARY DATA FOR UNADAPTIVE INTERPERSONAL BEHAVIORS

Scale	Ward Sample Mean	MAZE Pre-Obs Mean	MAZE Post-Obs Mean	MAZE Gain or Loss Mean
SCALE 6: Inappropriate Contact with Others				
With Staff	0.18	0.12 (M0)	0.02 (M-)	-0.11 (0)
With Peers	0.64	0.00 (1)	0.02 (M-)	+0.02 (0)
TOTAL SCALE 6	0.82	0.12 (M-)	0.04 (M-)	-0.09 (0)
SCALE 7: Aggression, Withdrawal				
With Staff	0.02	0.10 (M0)	0.10 (M0)	0.00 (0)
With Peers	0.23	0.16 (M0)	0.38 (M0)	+0.21 (0)
TOTAL SCALE 7	0.25	0.26 (M0)	0.48 (M0)	+0.21 (0)

(1) The variance equals the standard deviation equals 0.

There is no evidence of significant change on any of the four subscales in this category. All of the subscales started at a very low frequency and remained so during the pre- to post-observation interval. There is some weak evidence, again because of the very low absolute frequency of behaviors on these subscales, that MAZE students improved when compared to the ward population in the area of inappropriate contact with staff.

BSAB-II: Adaptive Self-Directed Behaviors

Adaptive self-directed behaviors are scored on Scale 8 which consists of five items measuring inactivity, generalized activity, exploratory-searching activity, recreational activity and self-regard. Scale 8

is scored on an interval basis. The scale score was generated by summing the scores for each of the items after one of the items, "inactivity," had been multiplied by -1. Estimates of means for the ward sample were developed by performing the same transformations on published item means and dividing by four.

SUMMARY DATA FOR ADAPTIVE SELF-DIRECTED BEHAVIORS

Scale	Ward Sample Mean	MAZE Pre-Obs Mean	MAZE Post-Obs Mean	MAZE Gain or Loss Mean
SCALE 8: Generalized, Exploratory, Recreational Activity	8.61	6.60 (M0)	12.34 (M+)	+5.89 (+)

The data show a significant gain during the pre- to post-observation interval for this scale. Thus, there is evidence indicating an increase in adaptive self-directed behaviors for MAZE students. The largest improvements occurred in the item "generalized activity" and the item "inactivity." The data also show a substantial improvement compared to the ward population. The pre-observation mean was nonsignificantly below ward levels while the post-observation mean was significantly above the ward mean. Thus, there is substantial evidence to indicate a marked improvement of MAZE students in the category of adaptive self-directed behaviors as measured by the scale. Reconsidering the data from Scale 2, stereotypy, the data indicate a shift in MAZE students' self-directed behavior from those coded as unadaptive to those coded as adaptive.

BSAB-II: Adaptive Interpersonal Behavior

Three scales measure adaptive interpersonal behavior, Scale 9 (six items), Scale 10 (twelve items), and Scale 11 (three items). Scale 9 records observations of fundamental social behaviors (noncommunication) such as approaching and responding to and initiation of physical contact. Scale 10 records observations of responding to or initiation of social vocalizations, gestural communications, and expressive communications. Scale 11 records observations about the manner in which the student responds to negative peer contact.

Scales 9 and 10 have two subscales, one for peers and one for staff. All three scales are event type scales and scale scores are generated by summation. Estimates of means for the ward sample were developed by summing items reported in the manual and dividing by four.

SUMMARY DATA FOR ADAPTIVE INTERPERSONAL BEHAVIORS

Scale	Ward Sample Mean	MAZE Pre-Obs Mean	MAZE Post-Obs Mean	MAZE Gain or Loss Mean
SCALE 9:				
Fundamental Social Behavior: Noncommunication				
With Staff	1.30	1.08 (M0)	1.68 (M0)	+0.68 (+)
With Peers	0.42	1.84 (M+)	1.57 (M+)	-0.34 (0)
TOTAL SCALE 9	1.72	2.92 (M+)	3.26 (M+)	+0.34 (0)
SCALE 10:				
Fundamental Social Behavior: Social Localization & Gestures				
With Staff	1.19	5.34 (M+)	8.85 (M+)	+3.43 (+)
With Peers	0.35	2.26 (M+)	2.38 (M+)	+0.21 (0)
TOTAL SCALE 10	1.54	7.60 (M+)	11.23 (M+)	+3.62 (+)
SCALE 11:				
Appropriate Response to Negative Peer Contact	0.28	0.34 (M0)	0.32 (M0)	-0.02 (0)

The staff subscales for both Scale 9 and Scale 10 showed significant increases during the pre- to post-observation interval. A few students showed a dramatic improvement accounting for the large gain scores. In comparison with the ward sample, MAZE students started significantly above the ward sample on three of the four subscales and maintained their comparative advantage. These data suggest that MAZE students made an improvement in adaptive interpersonal behaviors with staff persons. While no improvement is seen for communication with peers, MAZE students began and continued at levels well above those recorded for the ward sample. The low absolute scores for Scale 11 may be interpreted as either a low rate of appropriate response or a low rate of negative peer contact to respond to. The scale provides no way of differentiating between these alternative hypotheses.

BSAB-II: Verbal Communication

Scale 12 and Scale 13 record verbal communication behavior. Scale 12 (ten items) records nonfunctional, repetitious, or inarticulate verbalizations. Scale 13 XIII (fourteen items) records verbalizations of increasing complexity, ranging from single words to continuous conversations. Each scale is composed of staff and peer subscales. Both Scale 12 and Scale 13 record events. Scores for each subscale, for both MAZE and ward samples, were generated by summing appropriate items.

SUMMARY DATA FOR VERBAL COMMUNICATION

Scale	Ward Sample Mean	MAZE Pre-Obs Mean	MAZE Post-Obs Mean	MAZE Gain or Loss Mean
SCALE 12: Nonfunctional, Repetitious, or Inarticulate Verbalization				
With Staff	0.61	2.60 (M+)	2.74 (M+)	0.00 (0)
With Peers	0.23	1.44 (M0)	0.64 (M0)	-0.79 (0)
TOTAL SCALE 12	0.84	4.04 (M+)	3.38 (M+)	-0.79 (0)
SCALE 13: Verbalization				
With Staff	0.67	1.62 (M+)	3.19 (M+)	+1.47 (+)
With Peers	0.11	0.94 (M+)	0.96 (M+)	-0.04 (0)
TOTAL SCALE 13	0.79	2.56 (M+)	4.14 (M+)	+1.43 (+)

The only significant gain score was that for the staff subscale on Scale 13. The gain score data were skewed in contrast to most of the gain score data for the rest of this report. Five students showed very high gain scores, hence accounting for the significant differences. On the pre-test, 72% of the students scored one or less for Scale 13, staff subscale, while the comparable percentage on the post-observation was 70%. Thus the data suggest that only a few MAZE students significantly improved their verbal communication with staff. With respect to the ward sample, the relative positions of the two samples did not change during the pre- to post-observation interval. MAZE students both started and finished significantly better than the ward sample.

BSAB-II: Play Activities

Play activities are measured by three scales, Scale 14 (four items), Scale 15 (four items), and Scale 16 (six items). Scale 14 records observations of behaviors where the student makes use of an object while playing. Scale 15 records occurrences of playful contact with both staff and peers. Scale 16 records behaviors classified as responding appropriately to play, initiating play, and continuous play. Both Scale 15 and Scale 16 have two subscales, one for staff and one for peers. Scale and subscale scores were calculated by summing appropriate items.

SUMMARY DATA FOR PLAY ACTIVITIES

Scale	Ward Sample Mean	MAZE Pre-Obs Mean	MAZE Post-Obs Mean	MAZE Gain or Loss Mean
SCALE 14:				
Object Relations	0.38	4.32 (M+)	6.17 (M+)	+1.98 (+)
SCALE 15:				
Playful Contact				
With Staff	0.36	0.18 (M-)	0.45 (M0)	+0.25 (0)
With Peers	0.21	0.80 (M+)	0.64 (M0)	-0.21 (0)
TOTAL SCALE 15	0.57	0.98 (M0)	1.09 (M0)	+0.04 (0)
SCALE 16:				
Play Activities				
With Staff	0.23	0.28 (M0)	0.64 (M0)	+0.40 (0)
With Peers	0.13	1.04 (M+)	0.77 (M0)	-0.21 (0)
TOTAL SCALE 16	0.36	1.32 (M0)	1.40 (M+)	+0.19 (0)

Only Scale 14, Object Relations, showed a significant increase during the pre- to post-observation interval. The largest improvements were for items recorded as "manipulates objects inappropriately" and "manipulates objects appropriately." In comparison with the ward sample, the MAZE sample maintained its improved, significantly better position on both pre- and post-observation and gained even more. For both the peer subscales of Scale 15 and Scale 16 the MAZE sample non-significantly worsened in comparison to the ward sample. Finally, in terms of playful contact with staff, the MAZE sample improved its standing in comparison to the ward sample. These data suggest that improvement in MAZE students' play activities have occurred only with respect to play activities which involve objects and there may be some slight improvement in play activities with staff members.

BSAB-II: Response to Instructions

Scales 17, 18, and 19 record observations about student's response to instructions. Scale 17 (four items) measures response to general group instructions, to simple instructions, to complex instructions, and noncompliance. Scale 18 (three items) measures student's behavior in response to firmly given instructions, including the student's response to physical guidance. Scale 19 (four items) records observations about the student's response to and initiation of cooperative contact and task assignment.

With the exception of two items on Scale 19 which are interval observations, all items on these three scales are event observations. One item on Scale 17, "noncompliance," and one item on Scale 18, "resists physical guidance," were scored as negative numbers. Scale scores were generated by summing items within each scale.

SUMMARY DATA FOR RESPONSE TO INSTRUCTIONS

Scale	Ward Sample Mean	MAZE Pre-Obs Mean	MAZE Post-Obs Mean	MAZE Gain or Loss Mean
SCALE 17: Response to Instructions	0.13	1.34 (M0)	4.02 (M+)	+2.81 (+)
SCALE 18: Response to Firmly Given Instructions	0.13	2.32 (M+)	3.62 (M+)	1.43 (0)
SCALE 19: Cooperative Contact	0.25	0.52 (M0)	1.02 (M+)	+0.47 (0)

Scale 17 shows a significant pre-observation to post-observation gain. While the gain scores for both Scales 18 and 19 were nonsignificant. With respect to the ward sample Scale 17 and 19 showed an improvement in standing. While on Scale 18 the MAZE sample maintained and improved its relative standing over the ward sample. These data suggest that MAZE students have improved in their quality of responding to instruction. The greatest improvements were made in responding to simple instructions, responding to physical guidance, and decreases in instances of noncompliance.

Overall Summary of Balthazar Data

The preceding tables displayed data of 31 instances on pre-observation and 32 instances on post-observations where comparisons between MAZE and ward samples could be made. In some cases, for either observation, MAZE students were significantly better than the ward population, in others significantly worse, and in the remainder not significantly different. The following table shows the frequency of each of these comparisons.

MAZE students compared to ward sample were "significantly" ...	Pre-Observation	Post-Observation
Better	11	17
The same	17	15
Worse	3	0
Totals	31	32

There were 39 instances where a comparison between pre- versus post-observational differences could be made. Of these 39, fifteen showed "significant" improvement, fourteen showed "nonsignificant" improvement, ten showed "nonsignificant" worsening and zero showed "significant" worsening.

Overall these data provide evidence that the behavior of MAZE students has improved during the 1976-77 academic year. These improvements have occurred in eating behaviors, some dressing behaviors, and some toileting skills, these all being measures of functional independence. In terms of social adaptive behaviors, MAZE students showed a shift from unadaptive to more adaptive self-directed behavior, the maintenance

of an already low level of unadaptive interpersonal behaviors, an improvement in interpersonal behaviors with respect to staff members, some improvement in terms of verbal communication with staff, an improvement in playing with objects, and an improvement in student response to instructions. There were no cases where there was significant worsening of the student's behavior during this period of time as measured by the Balthazar scales.

We remind the reader of the context in which these generally very favorable findings should be viewed. MAZE students are severely and profoundly physically and/or mentally handicapped persons. We urge the reader to reexamine pre- and post-data levels for MAZE students and compare them again with the ward sample reported in the data above.

We cannot at this point, however, recommend the Balthazar instrument for other public school settings unless major changes are made in administration of the instruments. In particular the observations should be considerably shortened to focus on behaviors of particular interest to the teaching staff. We have devoted the equivalent of 144 days of staff time to merely collecting the pre- and post-observations. We have spent an additional month or more in analysis of the data to say nothing of the cost of computer time and data manipulation. Keep in mind that the Balthazar instruments are designed to be used where there is continuous, on-site monitoring of ward inmates' behavior. On the other hand, our use of the Balthazar instruments has allowed us to provide evidence of student progress. It is possible that with some

substantial modifications of the Balthazar instrument it could be used by public school personnel to mointor student progress.

Once again, we remind the reader that the reliability and validity of the data we have collected by use of the Balthazar instruments, does not allow us to unreservedly assert that the gains demonstrated by these data are indeed real. We were unable to provide solid data that the twin hypotheses of observer bias and/or observation unreliability could not account for the gains that we have shown. However, the Balthazar data do provide an additional set of evidence in support of other, less formal measures of the successes of MAZE programming for severely and multiply handicapped students.

As a final note, staff persons who performed the pre- and post-observations have been motivated to begin work on developing more feasible observation procedures. They reported that they could see the differences in behavior by being required to perform them in a structured, disciplined way. In September 1976, observers were skeptical that any progress could be documented by an instrument of this type. In May 1977, observers reported a considerably different attitude towards the desirability and usefulness of this type of data collection.

EPILOG

All direct and indirect services developed by MAZE will be continued after June 30, 1977 when the MAZE Project completes its mission. These services have been accepted as an integrated part of the Madison Metropolitan School District (MMSD) even though Federal funding will be discontinued. It is a tribute to the citizens of Madison that they have extended the right to a free public education to all children. There is a sense of pride in this fact within the community. It has been personally fulfilling to have been involved in the evolution of the services for severely and profoundly handicapped. I would like to take this opportunity to thank the community and the excellent professional staff of the MMSD. It is impossible to describe the dedication and effort of the collected indivduals who have accomplished this practical zero exclusion model. In the final analysis it is positive change in children which has and will continue to motivate staff and parents. Certainly this has been the result of the sum of their efforts.